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## M. FROIDEVAUX'S PARIS LETTER.

PARIS, January 20, 1903.

The Marine Hydrographic Service, the history of which from its foundation in 1720 to the present day was briefly sketched in my letter of May, 1902, preserved throughout the 19th century practically the same organization, with but slight modifications. At present, by the decree of the 25th of September, 1901, the Service is under the direct orders of the head of the Marine General Staff. The *personnel*, composed of hydrographical engineers, higher and subaltern officers of the navy, administrative functionaries and technical agents, is divided into seven sections: (1) *Service of General Hydrography*; (2) *Service of the French Coasts*; (3) *Service of Charts and Archives, and Tide Service*; (4) *Service of Nautical Instruction*; (5) *Service of Scientific Instruments*; (6) *Service of Nautical Instruments*; (7) *Service of Nautical Meteorology*. Four of these, together with the Bureau of Administration, the storehouse and the library, are under the orders of the Director of Hydrography; the 4th, 6th and 7th Services, at the head of which is a captain or a lieutenant, are immediately under the chief of the General Staff. All the work of the different services, as well as the questions proposed by the Minister, are examined by a Hydrographic Committee, composed of the Director, two superior naval officers, two chief engineers, and a secretary, and are presided over by an Admiral.

The General Hydrographic Service is charged with the construction and issue of charts and hydrographic plans of the coasts in all parts of the globe, with the exception of France, Algeria, and Tunisia. It supervises the work of engraving the new charts, and, after the proofs have been passed upon by the Hydrographic Committee, gives the final order for printing. It is by this body, also, that the existing charts are kept up to the level of the latest information received, and published either in new editions or with simple corrections on the plates and charts. The expeditions sent out to survey distant coasts receive their instructions from the same source.

These expeditions, but lately occupied in the successful exploration of foreign shores (Brazil, Newfoundland, Japan, etc.), are at present restricted to our colonies, the coasts of which were

insufficiently known. Hydrographical engineers direct the more important of these enterprises, such as that of Madagascar, which in 1889-1894 and since 1899 has charted the northwestern coast of the island from Cape Saint-André to Diego Suarez, and has made partial reconnaissances of the most important points on the western coast, south of Cape Saint André. Other expeditions, embracing no long extent of coast, are made by officers of naval divisions : such are, in Africa, the survey of the rivers of the French Congo and French Guinea and that of the gulf of Tadjurra ; in Asia, the revision of the charts of the rivers in lower Cochin-China ; in Oceania, the survey of the Gambier Islands, that of Tubiai, and that of the most westerly group of the Tuamotu Islands.

The results of these different expeditions have already appeared, or will appear, in the charts, of which there are now published by the *Service* nearly 2650, in various styles and scales : charts covering an ocean or a sea, and showing the lines of navigation ; coasting and landing charts ; charts of much-frequented coasts, where ports are numerous and ships keep close to the shore ; special plans of ports, of anchorages, of straits and difficult passages, full of perils. All these charts are constantly corrected and kept up with the changes brought about by the development of navigation, by the creation of new economical relations, by the work of man and by the incessant operations of nature. Many of these corrections necessitate the issue of new editions of charts ; those of a less considerable kind, such as the indication of an isolated danger or a change in a light or a buoy, are noted in special bulletins, and recorded on new issues of the charts.

The incidents of a geographical nature during the past two months have been few. Of these we may call attention to four addresses at the Conservatoire des Arts et Métiers on the subject of Oceanography. Two of these, by M. Julien Thoulet, were on the Science of Oceanography, one, by Dr. Portier, on Physiology and Microbiology, and one, by M. Joubin, discussed the Marine Fauna of the great depths.

In order to widen the public acquaintance with the vital questions relating to North Africa, the Administrations of Algeria and Tunisia have founded, at the Sorbonne and the Collège de France, two chairs, one consecrated to the Geography and the Colonisation of North Africa, the other to Mussulman Sociology and Sociography. The incumbents, MM. Augustin Bernard and Le Châtelier, open their course with a study, each from his own point of view, of Morocco. Another chair, that of American Antiquities, recently

established in the Collège de France at the instance of the Duke de Loubat, is filled by M. Léon Lejeal, who has selected for this year's course the Examination of the Spanish sources of Pre-Columbian American History, and, with this, the study of various questions of Mexican archæology.

If we turn to the explorations now on foot, we find but little that is of interest. In Africa, Lieut. Guillo-Lohan, an officer of the Territory of the Saharan Oases, has made, to the south of In-Salah, and notably in the regions of the Hoggar, an excursion which may be expected to yield good results. The Anglo-French Commission to settle the limits between the Niger and the Chad begins with the reconnaissance of the regions traversed by the conventional frontier of 1898, and, particularly, the famous Sokoto arc of the circle. The Commission is also to seek for a practicable route of approach to Zinder, capital of the Third Military Territory, the map of which, recently drawn by Capt. Moll, will now be completed and rectified by him.

In Eastern Africa Viscount du Bourg de Bozas has continued the explorations of which we have previously written. A letter of September 9 brought information that the party had reached Lamule, at the confluence of the Nile with the Niama, about midway between Lado and the Albert Nyanza. The travellers made their way to the bank of the Nile from the southern edge of the Abyssinian plateau, passing along the valley of the Usne till it joined the Omo, and then following this river and exploring the northern coast of Lake Rudolf, and then through the unknown country of the Turkwanas. They mapped their route with great care by astronomical observations, and made important collections in ethnography and natural history. M. Du Bourg de Bozas hoped to cross the Congo Free State and terminate his journey in the French Congo. No other French expedition of similar importance has been made in recent years; but we must not overlook the travels of Count Lesdain, of the Legation at Peking, in Mongolia, in June-September, 1902, through an arid and mountainous region and over the vast plains to the north of the Hwang-Ho, transformed by the periodical floods of the river into a lake in which the villages form so many islets.

Some excellent works call for attention, in the general sterility of scientific publications in the holiday season. The first is the Report to the Glacier Commission of the French Alpine Club on Variations of the French Glaciers in 1900-1901. The author of the Report, M. W. Kilian, confines himself to a careful account of

the glaciers of Dauphiné,\* accompanied by sketches and photographs, and followed by an admirable Review of Glaciology, full of facts and complete references, by M. Charles Rabot, who takes up, in succession: (1) The works relating to the physical and geological phenomena; (2) The recent explorations accomplished in the various glacial regions of the globe and the interesting phenomena of which he has taken cognizance; (3) The observations on variations in the length of glaciers. This Review, which is, in its line, as valuable to workers as the same writer's Review of Limnology, needs but one thing to make it complete: an index of names of places.

Thanks to the perseverance and productive resources of M. E. A. Martel and his scholars *speleology* has really become a special branch of natural science. The recent labours of the intrepid explorer of caverns throw new light upon several controverted points. Particularly important in this respect is the study of the subterranean river of Trépail (Marne) which constitutes the 88th Bulletin of the *Services de la Carte Géologique de France*. M. Martel's reconnaissance of this river in 1902 furnishes exact information on the circulation of the water in the chalk and seems to complete the overthrow of two very tenacious theories: that of the sheets of water in the calcareous and chalk formations, and that of the determination of the line of subterranean water-courses by the caverns. The explorations of Messrs. Van den Broeck and Martel at Han-sur-Lesse establish the fact (contrary to the recent statements of M. E. Dupont) that the subterranean Lesse is a single current, with occasional overflows and diversions of freshets and that the unknown portion of the course of the famous Belgian stream barely exceeds two kilometres. A most absorbing paper, published by M. Martel in the *Bulletin de la Société d'Etudes des Hautes Alpes*, on the Chouruns† of the Devoluy, calls the attention of speleologists to a field of exploration as yet almost untouched. The *chouruns* are not all known, nor is the position of their openings identified on the map, and it is too soon to make an attempt at their topographical classification; but M. Martel gives precise information concerning the Chourun Martin, the deepest abyss in France and, indeed, the deepest natural abyss yet known—at least 310 metres (1017 feet) and perhaps more than 500 metres (1640 feet).

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\* This Report is, therefore, less complete than the two articles by Prince Roland Bonaparte, published in 1891 and 1892 in the *Annuaire du Club Alpin Français* on the Periodical Variations in the French Glaciers previous to 1890.

† *Chourun* is a local expression signifying *cavern* or *abyss*, and designating, above all, cavities descending perpendicularly to a very great depth.

Not less interesting, for another portion of the Alps, is the Study on the Formation of the Relief in the Diois and the Eastern Baronnies by M. V. Paquier, in *La Géographie*. This memoir is the complement of the Geological Researches of the same author in the region indicated, and it shows that the southern Diois, with its clearly-defined synclinal areas, almost east and west, is the continuation towards the north of the Baronnies, to which, moreover, it is tributary.

The geography of regions outside of France is not overlooked. M. Emmanuel de Martonne, of the Faculté des Lettres de Rennes, publishes, under the title of an Essay in Geographical Monography on Wallachia, a very complete study, fortified by travel in various parts of the country, and treating with equal care and attention the anthropogeographical and the geophysical aspects of the subject. This conscientious work, creditable in every way to its author, is illustrated by maps, sketches, and engravings.

The articles on the Natural Divisions of Algeria by MM. A. Bernard and Emile Ficheur, in the recent numbers of the *Annales de Géographie*, may be said to trace the plan of detailed work, the execution of which, it is to be hoped, will be entered upon in no long time. M. Edmond Douitté has contributed to the Bulletin du Comité de l'Afrique Française a summary report on his third journey in Morocco. This paper contains valuable notices on the tribes of the Hoûz. With it may be mentioned Capt. Cauvet's notes on the Touareg to the south of In-Salah; Lieut. Requin's account of a reconnaissance of the Mouydir plateau, executed by the *chef d'escadron* Laperrine, May 16-June 18, 1902; and the first part of M. Georges Thomann's report of a journey from the Ivory Coast to the French Sudan. A complete statement of the latest geographical work done in Madagascar, from the pen of Gen. Gallieni, is published in *La Géographie*, where also will be found the story of M. J. B. Charcot's excursion to Jan Mayen in 1902.

In historical geography M. Gabriel Marcel has published a notice of the plan of Paris, called the *Plan de Bâle*, the work of Olivier Truchet, who was the engraver of the maps of France and of Picardy by Jean Jolivet. The first volume of an admirably illustrated work by Messrs. Alfred and Guillaume Grandidier embraces a collection of works on Madagascar, published between 1500 and 1613, in Portuguese, Dutch, English, French, German, Italian, Spanish and Latin, either complete or in extract.

HENRI FROIDEVAUX.